

IN THE CLAIMS

1. A navigation system, comprising:
  - a first navigation receiver having a first millisecond epoch timing signal, a first reference frequency signal, and first antenna;
  - a second navigation receiver collocated with said first navigation receiver and having a second millisecond epoch timing signal, a second reference frequency signal, able to view an identical constellation of navigation satellites as said first navigation receiver, and able to ascertain codephase and frequency information about each of said constellation of navigation satellites before the first navigation receiver;
  - a connection from the first navigation receiver to the second navigation receiver for providing at least one of said first millisecond epoch timing signal and said first reference frequency signal such that the relative differences between corresponding said first and second millisecond epoch and reference frequency signals can be ascertained;
  - a bootstrap message from the second navigation receiver to the first navigation receiver for providing codephase and frequency information about each of said constellation of navigation satellites relative to said first millisecond epoch timing and reference frequency signals.
2. The system of claim 1, wherein:
  - the second navigation receiver includes non-coherent acquisition of the navigation data phase of each of said constellation of navigation satellites, and

provides the bit transition time (BTT) in the bootstrap message.

3. The system of claim 1, wherein:

5       the first navigation receiver includes coherent acquisition of said constellation of navigation satellites and includes carrier phase measurements.

4. The system of claim 1, wherein:

10      the first navigation receiver and second navigation receiver are such that they share a common radio frequency (RF) downconversion stage.

5. The system of claim 1, wherein:

15      the first navigation receiver and second navigation receiver are such that the first reference frequency signal and second reference frequency signal are produced by the same oscillator source.

20      6. A bootstrap tandem navigation receiver system, comprising:

      a survey navigation receiver for making carrier phase measurements and able to acquire individual navigation satellites with coherent techniques;

25      a high-sensitivity navigation receiver able to acquire individual navigation satellites with non-coherent techniques that can produce all twenty millisecond predetection interval (PDI) hypotheses for the bit transition time (BTT) of the navigation data  
30      phase of each of said individual navigation satellites; and

      a bootstrapping message from the high-sensitivity navigation receiver to the survey navigation

receiver that during initialization eliminates searching for the carrier frequency, codephase, and BTT of said individual navigation satellites by the survey navigation receiver.

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7. A navigation system, comprising:

a first navigation receiver that includes coherent acquisition of a constellation of navigation satellites and includes carrier phase measurements, and further having a first millisecond epoch timing signal, a first reference frequency signal, and first antenna;

a second navigation receiver collocated with said first navigation receiver and including non-coherent acquisition of the navigation data phase of each of said constellation of navigation satellites, and able to view an identical constellation of navigation satellites as said first navigation receiver, and able to ascertain codephase and frequency information about each of said constellation of navigation satellites before the first navigation receiver; and

a bootstrap message from the second navigation receiver to the first navigation receiver for providing the bit transition time (BTT).

25 8. The navigation system of claim 7, wherein:

the second navigation receiver shares at least one of said first millisecond epoch timing signal and said first reference frequency signal.

9. A bootstrap tandem navigation receiver system, comprising:

a survey navigation receiver for making carrier phase measurements and able to acquire individual

5 navigation satellites with coherent techniques;

a high-sensitivity navigation receiver able to acquire individual navigation satellites with non-coherent techniques that updates all twenty millisecond predetection interval (PDI) hypotheses for the bit

10 transition time (BTT) of the navigation data phase of each of said individual navigation satellites with 20-

millisecond coherent PDI's and determines the most likely BTT; and

15 a bootstrapping database for receiving informational messages from the high-sensitivity navigation receiver to the survey navigation receiver that during initialization eliminates searching for the carrier frequency, codephase, and BTT of said individual navigation satellites by the survey navigation receiver.